

BEST AVAILABLE COPY

LISTING OF CLAIMS

LISTING OF THE CLAIMS

What is claimed, is:

1. (currently amended) A method of monitoring events in a computer network, the method comprising:

said computer network triggering said events, each event being provided with attribute values allocated to a given set of attributes of said each event,

simultaneously monitoring various event attributes versus the arrival time of each the events,

providing an event display with a cross plot having x and y coordinate axes, the x-axis presenting a time period and the y-axis presenting an attribute value range,

determining a primary attribute of the events selected from the given set of attributes to be presented with its attribute values on the y-axis of the cross plot,

allocating a first display label to the events indicating the attribute values of the primary attribute, providing a pattern algorithm to detect whether an arrived event is part of the given pattern on the basis of a comparison of the attributes allocated to the given pattern and of the attributes assigned to the arrived event, providing a mapping algorithm to map any attribute value of an attribute selected from the given set of attributes onto the y-axis of the cross plot,

allocating a second display label to the events indicating the attribute values of the attributes being uncovered as part of the given pattern,

1 plotting all the events arrived within the time period and including an attribute value allocated to
2 the primary attribute into the cross plot with the first display label indicating the primary
3 attribute, the position of the first display label of each event in the cross plot being determined on
4 the basis of the attribute value of the primary attribute of the event and its arrival time, and
5

6 plotting the all events arrived within the time period and being detected by means of the pattern
7 algorithm as part of the given pattern into the cross plot with the second display label indicating
8 the given pattern, the position of the second display label of each event in the cross plot being
9 determined by the mapping algorithm on the basis of the attribute value of the attribute of the
10 event being uncovered as part of the given pattern and its arrival time, and
11

12 viewing a secondary attribute of said each event together with the primary attribute on said
13 display.
14

15 2. (original) The method according to claim 1, further comprising:
16

17 recording the attribute values and the arrival time of a new event, determining on the basis of the
18 recorded attribute values of event whether or not the newly arrived event includes an attribute
19 value of the primary attribute, and if the newly arrived event includes the attribute value for the
20 primary attribute shifting the x-axis of the cross plot so that the time period being presented on
21 the x-axis covers the arrival time of the event, and
22

23 plotting the event arrived within the shifted time period into the cross plot with the first display
24 label indicating the primary attribute.
25

26 3. (original) The method according to claim 2 comprising the further steps of:
27

28 determining on the basis of the recorded attribute values of event whether or not the newly
29 arrived event is part of the given pattern on the basis of a comparison of the attributes allocated

1 to the given pattern and of the attributes assigned to the arrived event,

2
3 if the newly arrived event includes an attribute value of the given pattern adding the event to the
4 previous events being detected as part of the given pattern, and

5
6 redrawing all the events being associated with given pattern in the cross plot.

7
8 4. (original) The method according to claim 3, further comprising:

9
10 if the newly arrived event does not include an attribute value of the given pattern, determining on
11 the basis of the recorded attribute values of all previous arrived events by means of the pattern
12 algorithm whether or not the newly arrived event is part of a new pattern on the basis of a
13 comparison of the attributes allocated to the new pattern and of the attributes assigned to the
14 arrived events;

15
16 if the newly arrived event forms together with previous recorded events the new pattern,
17 allocating a third display label to the events indicating the attribute values of the attributes being
18 uncovered as part of the new pattern; and

19
20 plotting the all events being detected by means of the pattern algorithm as part of the new pattern
21 into the cross plot with the third display label indicating the new pattern, the position of the third
22 display label of each event in the cross plot being determined by the mapping algorithm on the
23 basis of the attribute value of the attribute of the event being uncovered as part of the new pattern
24 and its arrival time.

25
26 5. (original) The method according to claim 1, further comprising:

27
28 removing all the events including an attribute value allocated to the primary attribute from the
29 cross plot, if a primary attribute to be presented with its attribute values on the y-axis of the cross

1 plot is changed, allocating a fourth display label to the events indicating the attribute values of
2 the new primary attribute, and
3
4 plotting all the events arrived within the time period and including an attribute value allocated to
5 the new primary attribute into the cross plot with the fourth display label indicating the new
6 primary attribute, the position of the fourth display label of each event in the cross plot being
7 determined on the basis of the attribute value of the primary attribute of the event and its arrival
8 time.

9
10 6. (original) The method according to claim 1 comprising the further steps of plotting all
11 attribute values recorded for an event with the respective display label into the cross plot if the
12 event is selected by an operator, and displaying textual information associated with the selected
13 event on the event display.

14
15 7. (original) The method according to claim 1, wherein the pattern algorithm is suitable to
16 perform multi-attribute pattern recognition.

17
18 8. (original) The method according to claim 1, wherein each display label includes a specific
19 color and/or a specific mark layout.

20
21 9. (original) The method according to claim 1, wherein all events being uncovered as part of the
22 pattern are clustered by the corresponding display label.

23
24 10. (original) A computer program containing a program code to carry out the steps of the
25 method of claim 1, when the program code is running on a computer.

26
27 11. (original) A computer program containing a program code to carry out the steps of the
28 method of claim 1, said program code being stored on data carrier.

29

1 12. (original) An event visualization device for monitoring events in a computer network, the
2 device comprising means to perform the steps of the method as claimed in claim 1.
3

4 13. (original) An article of manufacture comprising a computer usable medium having computer
5 readable program code means embodied therein for causing monitoring of events in a computer
6 network, the computer readable program code means in said article of manufacture comprising
7 computer readable program code means for causing a computer to effect the steps of claim 1.
8

9 14. (currently amended) A program storage device readable by machine, tangibly embodying a
10 program of instructions executable by the machine to perform method steps for monitoring
11 events in a computer network, said method steps comprising the steps of ~~claim 1~~;

12
13 said computer network triggering said events, each event being provided with attribute values
14 allocated to a given set of attributes of said each event,

15
16 simultaneously monitoring various event attributes versus the arrival time of each the events,

17
18 providing an event display with a cross plot having x and y coordinate axes, the x-axis presenting
19 a time period and the y-axis presenting an attribute value range,

20
21 determining a primary attribute of the events selected from the given set of attributes to be
22 presented with its attribute values on the y-axis of the cross plot,

23
24 allocating a first display label to the events indicating the attribute values of the primary attribute,
25 providing a pattern algorithm to detect whether an arrived event is part of the given pattern on the
26 basis of a comparison of the attributes allocated to the given pattern and of the attributes assigned
27 to the arrived event, providing a mapping algorithm to map any attribute value of an attribute
28 selected from the given set of attributes onto the y-axis of the cross plot,
29

1 allocating a second display label to the events indicating the attribute values of the attributes
2 being uncovered as part of the given pattern.

3
4 plotting all the events arrived within the time period and including an attribute value allocated to
5 the primary attribute into the cross plot with the first display label indicating the primary
6 attribute, the position of the first display label of each event in the cross plot being determined on
7 the basis of the attribute value of the primary attribute of the event and its arrival time,

8
9 plotting the all events arrived within the time period and being detected by means of the pattern
10 algorithm as part of the given pattern into the cross plot with the second display label indicating
11 the given pattern, the position of the second display label of each event in the cross plot being
12 determined by the mapping algorithm on the basis of the attribute value of the attribute of the
13 event being uncovered as part of the given pattern and its arrival time, and

14
15 viewing a secondary attribute of said each event together with the primary attribute on said
16 display.

17
18 15. (original) A computer program product comprising a computer usable medium having
19 computer readable program code means embodied therein for causing the event visualization
20 device, the computer readable program code means in said computer program product
21 comprising computer readable program code means for causing a computer to effect the
22 functions of claim 12.

23
24 16. (previously presented) The method according to claim 1, further comprising:

25
26 recording the attribute values and the arrival time of a new event, determining on the basis of the
27 recorded attribute values of event whether or not the newly arrived event includes an attribute
28 value of the primary attribute, and if the newly arrived event includes the attribute value for the
29 primary attribute shifting the x-axis of the cross plot so that the time period being presented on
30 the x-axis covers the arrival time of the event,

1

2 plotting the event arrived within the shifted time period into the cross plot with the first display
3 label indicating the primary attribute;

4

5 determining on the basis of the recorded attribute values of event whether or not the newly
6 arrived event is part of the given pattern on the basis of a comparison of the attributes allocated
7 to the given pattern and of the attributes assigned to the arrived event;

8

9 if the newly arrived event includes an attribute value of the given pattern adding the event to the
10 previous events being detected as part of the given pattern;

11

12 redrawing all the events being associated with given pattern in the cross plot;

13

14 if the newly arrived event does not include an attribute value of the given pattern, determining on
15 the basis of the recorded attribute values of all previous arrived events by means of the pattern
16 algorithm whether or not the newly arrived event is part of a new pattern on the basis of a
17 comparison of the attributes allocated to the new pattern and of the attributes assigned to the
18 arrived events;

19

20 if the newly arrived event forms together with previous recorded events the new pattern,
21 allocating a third display label to the events indicating the attribute values of the attributes being
22 uncovered as part of the new pattern; and

23

24 plotting the all events being detected by means of the pattern algorithm as part of the new pattern
25 into the cross plot with the third display label indicating the new pattern, the position of the third
26 display label of each event in the cross plot being determined by the mapping algorithm on the
27 basis of the attribute value of the attribute of the event being uncovered as part of the new pattern
28 and its arrival time;

29

30 17. (previously presented) The method according to claim 16, further comprising:

1
2 removing all the events including an attribute value allocated to the primary attribute from the
3 cross plot, if a primary attribute to be presented with its attribute values on the y-axis of the cross
4 plot is changed, allocating a fourth display label to the events indicating the attribute values of
5 the new primary attribute, and

6
7 plotting all the events arrived within the time period and including an attribute value allocated to
8 the new primary attribute into the cross plot with the fourth display label indicating the new
9 primary attribute, the position of the fourth display label of each event in the cross plot being
10 determined on the basis of the attribute value of the primary attribute of the event and its arrival
11 time.

12
13 18. (previously presented) The event visualization device for monitoring events in a computer
14 network, according to claim 12, further comprising:

15
16 means for recording the attribute values and the arrival time of a new event, means for
17 determining on the basis of the recorded attribute values of event whether or not the newly
18 arrived event includes an attribute value of the primary attribute, and if the newly arrived event
19 includes the attribute value for the primary attribute shifting the x-axis of the cross plot so that
20 the time period being presented on the x-axis covers the arrival time of the event,

21
22 means for plotting the event arrived within the shifted time period into the cross plot with the
23 first display label indicating the primary attribute;

24
25 means for determining on the basis of the recorded attribute values of event whether or not the
26 newly arrived event is part of the given pattern on the basis of a comparison of the attributes
27 allocated to the given pattern and of the attributes assigned to the arrived event;

28
29 means for adding for if the newly arrived event includes an attribute value of the given pattern
30 adding the event to the previous events being detected as part of the given pattern;

1

2 means for redrawing all the events being associated with given pattern in the cross plot;

3

4 means for determining if the newly arrived event does not include an attribute value of the given
5 pattern, means for determining on the basis of the recorded attribute values of all previous
6 arrived events by means of the pattern algorithm whether or not the newly arrived event is part of
7 a new pattern on the basis of a comparison of the attributes allocated to the new pattern and of
8 the attributes assigned to the arrived events;

9

10 means for allocating if the newly arrived event forms together with previous recorded events the
11 new pattern, allocating a third display label to the events indicating the attribute values of the
12 attributes being uncovered as part of the new pattern; and

13

14 means for plotting the all events being detected by means of the pattern algorithm as part of the
15 new pattern into the cross plot with the third display label indicating the new pattern, the position
16 of the third display label of each event in the cross plot being determined by the mapping
17 algorithm on the basis of the attribute value of the attribute of the event being uncovered as part
18 of the new pattern and its arrival time;

19

20 19. (previously presented) The event visualization device for monitoring events in a computer
21 network, according to claim 18, further comprising:

22

23 means for removing all the events including an attribute value allocated to the primary attribute
24 from the cross plot, if a primary attribute to be presented with its attribute values on the y-axis of
25 the cross plot is changed, allocating a fourth display label to the events indicating the attribute
26 values of the new primary attribute, and

27

28 means for plotting all the events arrived within the time period and including an attribute value
29 allocated to the new primary attribute into the cross plot with the fourth display label indicating
30 the new primary attribute, the position of the fourth display label of each event in the cross plot

1 being determined on the basis of the attribute value of the primary attribute of the event and its
2 arrival time.

3
4 20. (currently amended) An article of manufacture comprising ~~a computer usable medium having~~
5 ~~computer readable program code means embodied therein for causing monitoring of events in a~~
6 ~~computer network, the computer readable program code means in said article of manufacture~~
7 ~~comprising computer readable program code means for causing a computer to effect the steps of~~
8 ~~claim 16~~ apparatus for monitoring events in a computer network, the method comprising:

9
10 said computer network having means for triggering said events, each event being provided with
11 attribute values allocated to a given set of attributes of said each event,

12
13 means for simultaneously monitoring various event attributes versus the arrival time of each the
14 events,

15
16 means for providing an event display with a cross plot having x and y coordinate axes, the x-axis
17 presenting a time period and the y-axis presenting an attribute value range,

18
19 means for determining a primary attribute of the events selected from the given set of attributes
20 to be presented with its attribute values on the y-axis of the cross plot,

21
22 means for allocating a first display label to the events indicating the attribute values of the
23 primary attribute, providing a pattern algorithm to detect whether an arrived event is part of the
24 given pattern on the basis of a comparison of the attributes allocated to the given pattern and of
25 the attributes assigned to the arrived event, providing a mapping algorithm to map any attribute
26 value of an attribute selected from the given set of attributes onto the y-axis of the cross plot,

27
28 allocating a second display label to the events indicating the attribute values of the attributes
29 being uncovered as part of the given pattern,

1 means for plotting all the events arrived within the time period and including an attribute value
2 allocated to the primary attribute into the cross plot with the first display label indicating the
3 primary attribute, the position of the first display label of each event in the cross plot being
4 determined on the basis of the attribute value of the primary attribute of the event and its arrival
5 time.

6
7 means for plotting the all events arrived within the time period and being detected by means of
8 the pattern algorithm as part of the given pattern into the cross plot with the second display label
9 indicating the given pattern, the position of the second display label of each event in the cross
10 plot being determined by the mapping algorithm on the basis of the attribute value of the attribute
11 of the event being uncovered as part of the given pattern and its arrival time, and

12
13 means for viewing a secondary attribute of said each event together with the primary attribute on
14 said display.